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WITH COMPLIMENTS OF THE AUTHOR.

MOVABLE KIDNEY;

With a Report of Cases Treated by Nephrorrhaphy.

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MOVABLE KIDNEY; WITH A REPORT OF CASES TREATED BY NEPHRORRHAPHY.¹

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In the opinion of the writer there is scarcely a subject of more practical importance and interest to the gynecologist than that of movable kidney. This conviction has steadily grown upon him since his attention was first attracted to the subject, nearly four years ago, since which time he has had abundant opportunity to note both the frequency of its occurrence in women and the important interdependent relations between movable kidney and diseases of the female sexual organs.

Indeed, in view of the fact that the subject of movable kidney has been more or less fully treated of within the past dozen years by Hahn, Landau, Keppler, Pokrowsky, Lindner, von Fischer, Litten, Henderson, McCosh, Keen, Senator, Schmitt, and others, it is astonishing how little is known of it—or, at least, how little practical application is made of this knowledge by both general practitioner and gynecologist. The latter could have found in it a solution of many perplexing difficulties which beset him in daily practice. Why, for instance, a woman, the lesions of whose genital tract have been successfully repaired by the gynecologist's art, and in whom no organic lesion can be discovered elsewhere, should, after operation, in spite of the gynecologist pronouncing her well, persist in asserting the contrary and in clinging to most, if not all, of her former symptoms, would no longer be an enigma. The solution, in many instances, might be found in the vicinity of the renal regions. There, also, in not a few instances, can be found the explanation of symptoms usually interpreted as dependent upon disease of the female genital organs, when a most critical and painstaking examination

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of those organs fails to reveal the least evidence of disease. Instances illustrating both of the above assertions I have repeatedly encountered in my own practice, and a few of them may be found recorded in the histories of cases appended to the end of this article.

The main explanation, to my mind, of the existing general apathy and indifference to a subject of such great practical importance, lies in the hitherto unsatisfactory therapeutics of the condition. A movable kidney is, in the vast majority of cases, one of the easiest things in the world to diagnosticate, provided only its possibility in a given case be borne in mind. But when it comes to treatment, bandages have proved inefficient; nephrectomy is a too radical and unjustifiable procedure; nephrorrhaphy has hitherto proven more or less disappointing, owing, as the writer believes, to imperfections of technique; massage has been too little tried, and meets with too general incredulity. It is one of the main purposes of this paper to furnish evidence that nephrorrhaphy, carefully performed after the method to be described later on, is capable in most, if not all, uncomplicated cases of movable kidney, of correcting the abnormality, and of relieving greatly or removing entirely the symptoms dependent thereon.

FREQUENCY.—The frequency of the condition has been variously estimated by different writers, depending probably upon the greater or less fidelity with which each patient presenting is examined for the existence of the condition, as well as upon varying individual ability to recognize the minor degrees of the abnormality. While some authorities assert that movable kidney is of very rare occurrence, Lindner, for instance, states that he found it in one out of every five or six women examined. My experience has satisfied me that Lindner is very nearly, if not quite, right. I have taken the trouble to look over the histories of the last 500 women examined by me, and among them I find 90 recorded as possessing, amongst other things, a movable kidney. I am confident that a similar experience awaits every gynecologist who will make it a matter of routine to examine every woman consulting him for the existence or otherwise of the condition. I should, however, not like to be understood as asserting that every movable kidney produces symptoms. On the contrary, I am convinced from personal observation that such is not the case, and that many owners of movable kidneys experience no noticeable discomfort from the condition. Just here lies the difficulty: to determine exactly what symptoms, in a given case, are probably due to a movable kidney, in as much as the lesion is so frequently associated with disturbances in the genital sphere and many symptoms are common to the two conditions.

Further on I hope to show, however, that this differentiation may be made with reasonable accuracy in nearly all cases.

ETIOLOGY.—The etiology of movable kidney is still greatly a matter of speculation and theory, and it will probably require considerable added experience, and perhaps experiment, to satisfactorily elucidate this part of the subject. Bartels is inclined to regard lacing as a causative factor in both men and women. I am led from my own observations to believe that the very opposite is the case, and that tight lacing is the most effective external agent we can apply to maintain a kidney in its normal position. Indeed, I am in the habit of prescribing a well-fitting and rather tight corset for women with movable kidneys, provided no contra-indication to the corset is found in the condition of the genital organs. In the few cases in which I have met movable kidneys in men, I have advised the wearing of a tight elastic abdominal supporter, the main compression being made about the waist.

Laxity of the abdominal parietes, the result mainly of child-bearing, has been regarded by many as a causative agent of movable kidney. This hypothesis, however, will not bear close scrutiny. It loses its value when we consider that as many, if not more, movable kidneys are found in virgins and nulliparæ as in multiparæ. The statistics of Lindner show this, and my own experience bears him out. That, however, laxity of the abdominal walls bears a certain, though small, share in the etiology of the affection, I am not prepared to deny.

The theory of a congenital anomaly or predisposition to the disease is one difficult to either prove or disprove. For the present it is a mere conjecture as far as concerns *movable* kidney: a *floating* kidney may depend upon a congenital mesonephron.

The theory which upon critical and judicial review of the cases under my observation seemed most satisfactorily to account for the development of the condition in a majority of instances, is that of absorption or atrophy of the peri-renal fat. It has been quite a common experience with me to note the beginning of symptoms due to movable kidney immediately after recovery from one of the wasting diseases, or on the occurrence of a noticeable loss of weight from any cause. My own clinical observation, therefore, would seem to indicate that loss of peri-renal fat is the chief etiological factor in the production of movable kidney, though I am inclined to believe that other causative agencies may play a part, less important and frequent though it be, in the development of the disorder. It is quite easy, for instance, to understand how excessive and prolonged vomiting might occasionally loosen a kidney, as in a case reported by Dr. C. O. Baker (*N. Y. Medical Record*, May 14, 1892). The patient, himself a physician, first noticed the development of

a movable tumor (kidney) in the right hypochondrium after a voyage in which he suffered much from incessant sea-sickness. Even in this case, however, rather clearly as the evidence points to vomiting as the cause, it may be questioned whether the movable kidney was not a result of the wasting of fat, including the peri-renal, due to the prolonged inanition.

A movable kidney may rarely develop quite suddenly, as in the case just mentioned, or the condition may be of more or less rapid growth. While the majority of movable kidneys undoubtedly require months, and even years, to develop, I have several times been in a position to observe, the development of a mobility of six to eight centimetres in a kidney, which from personal examination, I knew to be in its proper place two or three months previously. One or two such instances are narrated in the appended histories.

For practical purposes a distinction should be made between movable and floating kidney, although the latter condition probably represents, in some instances at least, but the final stage of development of the former. A movable kidney, as I interpret it, is one movable within a pouch or hollow formed within its own fatty capsule; while a floating kidney is one supplied with a mesonephron, the length of which determines the extent of its mobility. The floating kidney has normal relations with its fatty capsule, or at least that portion of the latter which it carries with it in its excursions. The movable kidney for reasons which will appear further on, produces more distressing symptoms than the floating kidney, although the latter has by far the greater range of mobility. The movable kidney is by far more frequent than the floating kidney. I have met at least fifty movable kidneys to every one floating kidney, and it is with the movable kidney alone that this paper has to deal.

Litten makes a further distinction between movable and wandering kidneys on the one hand and a dislocated kidney on the other hand. By the latter term I presume he means a displaced kidney fixed in its abnormal situation. I have met the latter condition but twice, the right kidney in each instance being fixed alongside the spinal column some eight centimetres below its normal position, and being insusceptible of reduction. A characteristic of the movable kidney is the facility with which it can be brought back to its normal situation.

Litten still further refines between a congenital wandering kidney (floating kidney?) and an acquired movable kidney. As used by the Germans, the term *Wanderniere* (wandering kidney) embraces both movable and floating kidneys. For reasons already stated, however, I prefer to maintain the distinction between the two.

The path of dislocation of a movable kidney varies. In a propor-

tion of cases, estimated at 75 per cent. by Lindner, it becomes displaced outward and then forward and inward along the course of the lower ribs until it reaches the region of the anterior superior iliac spine. In the remaining cases it moves directly inward and downward. Whatever may have been the original path of dislocation, the result, as far as the final position of the movable kidney is concerned, will be the same as soon as the organ has attained a range of mobility of ten to twelve centimetres. When this range of mobility has been attained, the kidney can be readily moved about anywhere within the segment of a circle whose centre is at the normal situation of the kidney, whose radius measures ten to twelve centimetres, and whose arc extends from the vicinity of the anterior superior spine of the ilium to the under surface of the liver.

The subject of movable kidney is of paramount importance to the gynecologist, because of its preponderating frequency in women as compared with men, and because its symptoms are so similar in many respects to those accompanying various lesions of the genital sphere. Perhaps, however, the comparative frequency of its occurrence in the sexes is not as great as usually supposed. Abdominal palpation is practised much more frequently upon the female than upon the male, and the gynecologist, with tactile sense sharpened by daily practice in bimanual examination, is much more likely to discover minor degrees of the lesion than is the general practitioner. And it is just these minor degrees that are the unrecognized cause of so much suffering and distress.

My practice being exclusively gynecological, I am scarcely in a position to estimate from personal observation the frequency of the occurrence of movable kidney in the male. I have seen but two cases in men, both of them during the past year. Both were personal friends, who, in speaking of their health, casually mentioned a combination of symptoms, such as is usually found associated with movable kidney. In both, upon examination, I found the right kidney movable to the extent of about ten centimetres.

Movable kidney, in women at least, occurs in the right side in the overwhelming majority of cases. I have seen the condition but four times on the left side, in three of the patients the right kidney being movable at the same time and to a greater degree than the left. In the fourth patient (Case I.) the left kidney became movable six months after fixation, by nephrorrhaphy, of a movable right kidney. Why the right kidney should so much more frequently become movable than the left I can only surmise. Perhaps it is more exposed to displacing influences on account of its situation immediately beneath the liver, a heavy organ, subject to great fluctuations in size and weight.

SYMPTOMS.—As already stated, many of the symptoms of movable kidney are common also to many diseases of the sexual organs in women. The symptoms of the earlier and of the later

stages of movable kidney differ considerably from each other, those of the earlier stages being by far the more distressing. The suffering, according to my observations, seems to be greater with a kidney movable from four to ten centimetres ; after the latter limit of mobility has been exceeded the symptoms generally abate in intensity and some of them disappear altogether. Quite enough morbid manifestations, however, remain to make the patient more or less a chronic invalid. It is but just to state, however, that this observation of the greater severity of the symptoms in the earlier stages of movable kidney, as compared with the later, does not harmonize with the experience of Lindner and others, who claim that the greater the degree of mobility the more severe and numerous the symptoms.

I will first describe what I consider to be the most prominent and characteristic combination of symptoms, as I have found it, in *uncomplicated* cases of movable right kidney, in which the mobility ranges from ten centimetres downward ; enumerating subsequently the other symptoms more or less frequently observed. *The morbid phenomena due to a movable right kidney in its earlier stages are : digestive disturbances, chronic in character ; general nervousness ; epigastric pain, usually located somewhat to the left of the median line, at or near the free border of the left costal cartilages ; cardiac palpitation ; inability to feel comfortable or to sleep when lying on the left side.* These symptoms, or as many of them as may be present in the particular case, are all more or less constant and chronic in character. When disease of the genital apparatus is associated with movable right kidney, the symptoms immediately become more manifold, and it requires close clinical study to differentiate between the manifestations belonging to the renal and the genital abnormality, especially as a movable kidney exceptionally produces symptoms such as dysmenorrhœa and atypical uterine hemorrhages which generally point to lesions of the genital tract. I will, therefore, dwell somewhat upon the symptoms above enumerated as usually accompanying movable kidney, before enumerating the other morbid manifestations more or less frequently observed.

The digestive symptoms usually observed are, in their order of frequency: anorexia; gaseous eructations; epigastric pain and distress, most severe from half an hour to three hours after meals; constipation ; occasional vomiting ; foul breath. Quite a number of patients suffering from movable kidney have been treated for years by the ablest practitioners for gastro-intestinal or intestinal catarrh before coming under my observation, and it is one of the most gratifying experiences to see how rapidly and completely these symptoms usually vanish after fixation of the movable kidney by a bandage or by nephrorrhaphy.

General nervousness, of greater or less degree, but always de-

cided, is the next most frequent concomitant of movable kidney. There is nothing peculiar about this nervousness to distinguish it from that due to other causes. It disappears to a marked extent, though not as rapidly or completely as the digestive symptoms, after fixation of the kidney.

The epigastric pain associated with movable kidney is quite constant in its location, being generally referred to a point some five to six centimetres to the *left* of the median line, at or near the free border of the left costal cartilages. The nature and source of this pain are not quite clear. It is not markedly increased by pressure, and in this respect differs from ordinary intercostal neuralgia. It appears to be independent of the digestive processes, occurring at any time, irrespective of the fullness or otherwise of the stomach. Landau calls it a cardialgia, and, for reasons to be explained later, I am of the opinion that this term is probably correct, albeit the pain is somewhat lower than that of cardialgia from other causes. This pain also disappears promptly after the malposition of the kidney is rectified.

Cardiac palpitation is one of the most annoying and persistent symptoms. In some patients it is almost constant, and occasionally they become so habituated to it that they are unaware that their heart is beating rapidly, although the examiner may find the pulse 120 or more. This symptom, like the general nervousness, yields more slowly than the other symptoms after fixation of the kidney.

The last of the principle symptoms is inability to rest with comfort or to go to sleep lying on the left side. That this symptom is not by any means imaginary is attested by the frequency with which patients complain of it before they are informed that they have a movable kidney, and by its prompt and complete disappearance after fixation of the kidney.

Among the other symptoms which, compared with the above, occur with comparative rarity in uncomplicated cases of movable kidney, I will merely mention the following: Vertigo; a dull back-ache; painful menstruation; increase of the menstrual flow; pain in region of displaced kidney; mild urinary symptoms, such as intermittent hydronephrosis, moderate polyuria, slight frequency of micturition; icterus; anæmia due to interference with the digestive functions. It is unnecessary to dilate upon these symptoms; they are quite secondary in importance to the five symptoms above described.

It is quite curious and interesting to observe the influence of menstruation and pregnancy upon the symptoms of movable kidney, these being always intensified during menstruation and during the early months of pregnancy, while they completely disappear during the latter half of utero-gestation. The explanation is probably this. During menstruation and the early months

of pregnancy the increased collateral flow of blood to the abdominal organs produces hyperæmia and increased weight of the displaced kidney, with intensification of the symptoms. During the latter half of pregnancy the uterine tumor pushes the kidney upward and supports it in its proper place in a better manner than can be done by any abdominal supporter. It has been an oft-repeated experience with me to have patients state that the only times at which they have felt well during many years past, ever since the beginning of their illness, was during the latter half of their pregnancies, whatever the number of the latter may have been. I have also noted in one case the appearance of symptoms of movable kidney immediately following the removal of a large ovarian cystoma. The cyst had, until removed, sustained the movable kidneys in their place, and thus kept the symptoms in abeyance.

Authors are not as yet agreed upon the mode of causation of the symptoms due to movable kidney. The majority of those who have expressed themselves upon this subject are of opinion that obliteration of the lumen of the duodenum by the displaced kidney leads to retention of the contents of the stomach, and, as a result of this, secondarily to the production of the other symptoms above narrated. They differ somewhat in their views as to how this duodenal obstruction is brought about. Lindner, for instance, believes that the descending kidney obliterates the lumen of the duodenum by traction, claiming to have substantiated this view by experiments on the cadaver. Bartels, on the contrary, holds that the middle or descending portion of the duodenum is closed by direct pressure upon it of the displaced kidney.

With all due respect to these high authorities and those who agree with them, I am of opinion that mechanical occlusion of the duodenum is insufficient to account for the symptoms of movable kidney, even if the hypothesis of a mechanical occlusion of the duodenum occurring as a sequence of movable kidney could be proven true, which, as far as I know, has not hitherto been the case. I think the explanation of the symptoms must be sought in other directions, and personally am inclined to look for it in disturbances of the abdominal sympathetic system, more especially of the solar plexus with its branches distributed to the abdominal and thoracic viscera. After reading the extract from Gray's *Anatomy*, which I shall presently quote, it does not seem to me difficult to understand how a movable kidney, by pressure and traction, by stretching and irritation of various parts of the important sympathetic centre called the solar plexus, and of its branches, is quite capable of producing all the various sensations and functional disturbances noted under the head of symptoms. While all cases, to my mind, become explicable by this theory, the hypothesis of duodenal obstruction fails entirely to explain

why the same series of phenomena occurs when either the right or the left kidney, or both, become movable. It may be claimed, and with justice, that the left kidney is rarely, if ever, movable alone, and that in this case the movable right kidney produces the symptoms. But Case I., narrated below, has the value of a crucial experiment in determining this question, and to me was proof positive that a movable left kidney, the right being securely anchored in its place, is capable of producing exactly the same symptoms as a movable right kidney. Indeed, it was the observation of the progress of this case that led me to abandon the view of duodenal obstruction which I had previously held, and to seek another explanation of the causation of the symptoms of movable kidney. The following quotation is from Gray's *Anatomy*. (The italics are mine.)

“The epigastric or solar plexus supplies all the viscera of the abdominal cavity. It consists of a dense network of nerves and ganglia, situated behind the stomach and in front of the aorta *and crura of the diaphragm*. It surrounds the coeliac axis and root of the superior mesenteric artery, extending downward as low as the pancreas and *outward to the supra-renal capsules*. This plexus, and the ganglia connected with it, receive the great splanchnic nerve of both sides, part of the lesser splanchnic nerves, *and the termination of the right pneumogastric*. It distributes filaments, which accompany, under the name of plexuses all the branches from the front of the abdominal aorta.”

This part of the subject would be incomplete without an allusion to the so-called “strangulated movable kidney” as described by Landau and later by Lindner, a typical illustration of which condition I have seen in but two instances. The symptoms then become acute; pain in the right side, vomiting, great restlessness, possibly a little febrile movement occur; the urine is diminished in quantity. This condition lasts from two to four days, when, with increased secretion of urine, the symptoms rapidly disappear. Landau thinks an obstruction of the renal vein by torsion accounts for the strangulation, while Lindner regards the symptoms as due to temporary obstruction of the ureter, by torsion or kinking, thus producing hydronephrosis.

DIAGNOSIS.—A movable kidney is, in my opinion, the easiest of all intra-abdominal conditions to diagnosticate. The diagnosis is made by the discovery of a movable tumor, of the size, shape, and consistence of the kidney, in the right hypochondriac or lumbar regions, or in the iliac fossa; in fact, by feeling a movable kidney in any other but its normal position. The recognition of a movable kidney is an easy matter, especially for the expert gynecologist whose tactile sense is educated by daily practice. With the patient in the dorsal position, and the thighs flexed to relax the abdominal parietes, the examiner sits at her right side, opposite the loins, and with his left hand passed under the small of her back, presses deeply into the renal region to either crowd the kidney out of its place, or to keep it from slipping unrecog-

nized into its normal position while the examination is being made. The fingers of the right hand palpating the front and side of the abdomen usually recognize the displaced organ without difficulty. When it is detected it should be caught between the fingers of both hands and gently pressed until it escapes alternately upward and downward from between the compressing fingers. The contour of the upper and lower poles and the entire characteristic kidney shape of the tumor are thus recognized without the possibility of mistake. The majority of movable kidneys when thus moderately pressed and handled are not sensitive to pressure; in a minority of cases the patient complains of slight, quite bearable pain. Landau has found that pressure upon a movable kidney causes cardialgia. I have never elicited this symptom, but have often produced a slight nausea on compression of the displaced organ. Perhaps the difference in the sensations of the patient may be due to varying degrees of pressure employed. The displaced kidney is almost uniformly of about normal size; in but five or six instances have I found it enlarged.

Should there be difficulty in palpating the kidney in the dorsal position, the left lateral decubitus (Sims' position), as recommended by Lindner, may be tried. I have myself never resorted to it. When I have failed, with the patient in the dorsal position, to dislodge a suspected movable kidney from its normal situation by pressure of the left hand applied to the back, I have always succeeded by directing the patient to sit upon the edge of a chair with the body inclined forward and the hands resting upon the knees. In this position I have never experienced difficulty in reaching a diagnosis. By employing this position, or the left lateral decubitus, the necessity of repeated examinations in doubtful cases, insisted upon by many authors, can be avoided.

Very rarely, indeed, should there be difficulty in distinguishing a movable kidney from other tumors of the abdomen, and reference to this part of the subject would scarcely be necessary were it not that errors have been made by the ablest diagnosticians. Thus in the case of Dr. Angus Mac——, already alluded to as reported by Dr. Baker, the patient acquired a movable tumor in the right hypochondrium as a result of prolonged vomiting from sea-sickness. Several clinicians of the highest reputation examined the tumor, and at least two of them pronounced it a movable kidney. The patient finally consulted Lawson Tait, who, ignoring previous opinions, made a diagnosis of distended gall-bladder and performed abdominal section. At the operation (presumably performed in the dorsal position), Tait found the gall-bladder and adjacent structures healthy and the "kidney *in situ*." He afterward said that the tumor was an hysterical tumor. Nephrorrhaphy was subsequently performed by Dr. Baker and the patient relieved of his long suffering.

It will thus be seen that a movable kidney may be mistaken for a distended gall-bladder. Attention to the shape and outlines of the tumor and to the range and direction of mobility should enable us to avoid this error.

The so-called "phantom or hysterical tumor" should never be mistaken for a movable kidney. If the hysterical tumor be due to intestinal distention, percussio will enable us to differentiate. If, as I believe is more frequently the case, the phantom tumor represents a localized spasmodic contraction of the abdominal muscles—most frequently of the recti—the expert fingers of the gynecologist should have no difficulty in detecting the condition. In very exceptional cases examination in narcosis would remove all doubt. I have myself never met with a case in which it was necessary.

A *movable* right kidney should never be mistaken for carcinoma of the stomach or adjacent viscera, although the symptoms in many cases of movable kidney are similar in many respects to those of malignant disease of the abdominal viscera. A right kidney dislocated downward and *fixed* in its abnormal position—a rare condition, fortunately—may offer difficulties of diagnosis.

The error of confounding the symptoms of a movable kidney and those of a chronic intestinal catarrh can only occur from failure to make a sufficiently painstaking examination, and is inexcusable at the present day.

PROGNOSIS.—A kidney once movable never again becomes *firmly* fastened in its *normal* position, except by operative interference. Its mobility, however, may be diminished by increased deposit of fat around the organ accompanying general improvement in nutrition. The intensity of the symptoms, whatever the latter be, remains about the same until the kidney attains a range of mobility of ten to twelve centimetres. After this range has been attained, and during the further increase in mobility, the symptoms are somewhat mitigated. The patient, however, as already stated, remains more or less a chronic invalid. A movable kidney may, however, become fixed in an *abnormal* position—rarely, I believe, by peritoneal adhesions, but rather by an induration or mild sclerosis of the fatty tissues surrounding it. A floating kidney, on the other hand, being contained in a fold of the peritoneum, may become fixed by agglutination of its peritoneal coat to neighboring peritoneal surfaces. When this occurs the symptoms are likely to become very distressing.

TREATMENT.—The dorsal decubitus will markedly mitigate or entirely remove, while it is maintained, the symptoms of movable kidney. It will, however, not lead to fixation of the kidney, no matter how long maintained, and the symptoms are certain to be reproduced on assuming the erect posture.

I know of one case greatly benefited, though not cured, by

the Weir Mitchell treatment of absolute rest in bed, forced feeding, massage, and electricity. The increased deposit of fat around the kidney probably explains the beneficial results, and the method may be tried in patients who can afford it, and who elect it after the alternatives have been fairly presented to them. Lasting relief can scarcely be expected, unless the obesity produced can be maintained or even increased. This amelioration of symptoms is, as already remarked, occasionally observed to follow improved nutrition without any special medication.

Eisenberg (*Wiener med. Presse*, 1891, No. 36) has reported successful results in the treatment of movable kidney by massage after Brandt's method. Further experience in this direction is needed before we can arrive at definite conclusions.

Abdominal supporters or bandages are relied upon by the majority of those who recognize in movable kidney a pathological condition requiring treatment. In our resources against the condition it ranks second to nephrorrhaphy; but in my opinion it is a poor second. It will always appeal strongly to minds with anti-surgical bias, and I confess that until I saw my way clear to a more efficient and perfected nephrorrhaphy, with more uniform and lasting results than existing reports supplied, I preferred to relieve my patients as best I could with bandages. Even after I had gained some confidence in my ability to fix a movable kidney by nephrorrhaphy, I still advised the trial of a bandage to obtain relief before resorting to operative measures. Faithfully as I tried bandages, however, I must own that I accomplished little good with them. This might *a priori* be expected, as a movable kidney in the readiest manner escapes from beneath even the compressing hand, probably the most perfect pad as yet devised. Inability to obtain desirable results from the use of the bandage, and the almost absolute certainty of relief by nephrorrhaphy in cases selected after careful study as indicating fixation of the kidney, have led me latterly to urge nephrorrhaphy as the first resort to patients with movable kidneys producing decided symptoms.

A bandage, to be effective in retaining a movable kidney, must support all the abdominal viscera and, through them, the displaced organ. The special compress or pad so generally used beneath the bandage over the front of the renal region is a delusion and a snare, the kidney escaping from beneath it with the greatest facility. It is scarcely consistent for one avowing a disbelief in the efficacy of bandages to follow such an avowal by an expression of predilection for certain forms of bandages. Whatever little good, however, I have accomplished in this direction has been by a simple bandage of elastic webbing entirely encircling the whole abdomen and making as much compression as the patient can comfortably bear. A well-fitting, rather tight corset

answers still better in males, and in women in whom no contra-indication to the wearing of a corset exists on the part of the sexual organs—a condition obtaining only in a minority of the cases I have seen.

Nephrectomy, or removal of the movable kidney, I mention only to condemn. It has no justification in this condition, while nephrorrhaphy, a much less dangerous and less mutilating operation, can be made to yield results almost, if not quite, as good and positive.

Lindner, in 1887, collected 36 nephrectomies for wandering kidney, with 9 deaths, a mortality of 25 per cent. Of these 36 kidneys, 9 were removed by the lumbar incision without a death, whereas 25 were extirpated by cœliotomy with 9 deaths. In 2 cases the method of operation is not stated. This appalling mortality, I am inclined to believe, would be lessened by the addition of more recent cases.

Lindner also collected 29 nephrorrhaphies with 1 death. Adding thereto my own 12 cases with 1 death, makes 41 cases with 2 deaths, a mortality of less than 5 per cent. This mortality rate would also, no doubt, be lessened by the addition of all published cases, of which I can recall quite a number, without remembering having read of an additional death. (*vide* Note, page 28.)

NEPHRORRHAPHY.—The main object of this communication is to advocate the performance of nephrorrhaphy, or fixation of the kidney by suture, in all cases of movable kidney where the patient's life is endangered by the persistence of the condition, or in which the sufferings are of such an aggravated character as to make life a burden. It is understood, of course, that a careful diagnosis must precede the operation. Such diagnosis must not be confined to the mere detection of a movable kidney, but must include a complete canvass of the patient's physical condition, all the organs, but especially the generative, being thoroughly interrogated for evidence of disease. Only after such thorough investigation can it be decided whether the symptoms, or the majority of them, depend upon movable kidney, and whether nephrorrhaphy is likely to afford relief. In many cases it will be found that operations upon the genital organs are indicated in addition to nephrorrhaphy. Whenever possible, all the various operations necessary in a particular case should be performed at the same sitting.

I will now describe the operation of nephrorrhaphy as I have practised it:

The patient is placed upon the table in the left lateral (Sims') position. Two small, firm pillows or cushions are so placed upon the table as to press into the left lateral and anterior regions of the abdomen, crowding the viscera upward to the site of operation and putting the latter well upon the stretch by separating, as

far as possible, the right twelfth rib from the crest of the right ilium. The same antiseptic and aseptic precautions are observed as at a cœliotomy. The incision, made along the outer edge of the erector spinæ muscle, should in all cases extend the entire distance between the lower edge of the twelfth rib and the crest of the ilium. It should be made more or less oblique, according to the lesser or greater distance between these points. The superficial fat, the tendon of the latissimus dorsi, and the conjoined tendon of the internal oblique and transversalis are successively divided along the whole length of the cutaneous incision until the peri-renal fat is reached. The outer fibres of the quadratus lumborum occasionally overlap the line of incision, and are then cut through along their length. The fatty capsule is penetrated by a small incision until the kidney with its capsula propria is detected at the bottom of the wound. Palpation of the kidney, with one or two fingers, through the wound of the fatty capsule, will enable us to get our bearings and determine the extent to which the length of the incision in the fatty capsule should be increased in both the upward and downward directions. The fatty capsule is incised along the whole length of the convexity of the kidney, after which it is drawn out of the wound as far as it will go, and the redundancy of the fat sac is cut off on either side at a level with the bottom of the wound. In doing this care must be exercised not to open the peritoneum at the lower pole of the kidney. The trimmed edges of the fatty capsules are secured with a small pair of T-shaped forceps for guidance in the subsequent suturing. The delicate part of the work now begins. The capsula propria of the kidney is incised along the whole length of the convexity of the organ in the mesial line. To do this successfully the kidney must be moved up and down so as to expose successively, at the bottom of the wound, the lower and upper halves of the organ. A pair of tenaculum forceps or two are of material aid in this and the subsequent parts of the operation. They must, however, be used with exceeding gentleness, as the kidney substance is exasperatingly friable, and they readily tear out. During this and subsequent steps of the operation it is of paramount importance that the kidney be pressed well into the bottom of the wound, so as to be readily accessible. If the two cushions spoken of at the beginning have been well placed under the left loin, nothing further is generally necessary, the kidney being well sustained in place, merely moving rhythmically upward and downward with respiration. If the cushions are not properly placed, or prove insufficient, the hand of an assistant pressing upon the abdomen so as to crowd the kidney into the wound must be made to take their place or to supplement them. After the capsula propria has been incised it is stripped off from the kidney substance on either side, until about one

and a quarter centimetres of the kidney substance are exposed on either side along the whole length of the incision through the capsule, thus making raw a surface ten to twelve centimetres long by two and a half centimetres wide for union with the deep parts of the lumbar incision. It is just here where nephrorrhaphy performed by stitching the fatty capsule alone, or by stitching the kidney without opening its capsula propria, failed, both the fatty capsule and the capsule proper being tissues in no way adapted to firm cicatricial union with contiguous parts. The stripped off capsula propria is not removed, but is doubled backward upon the still adherent portion like the lapel of a coat.

Thus far the steps of the operation have been identical in all my cases. In the method of suturing, however, I have made slight variations. At first I sewed with silkworm-gut, embracing on either side, in each suture, skin, superficial fat, the tendons of the abdominal muscles, the cut and trimmed edges of the perirenal fatty capsule, the reflected as well as the still adherent capsula propria. The loop of the suture penetrated the kidney substance to the depth of one to one and a half centimetres. Five or six such sutures were usually passed and tied upon the skin after a rubber drain had first been passed to the bottom of the wound and caused to lie along the raw kidney substance its whole length, with an end emerging at either angle of the wound. In my later cases I attached the kidney to the deeper and firmer tissues of the abdominal walls, the muscles and aponeuroses, by buried sutures of kangaroo tendon or silkworm-gut, passing a drain composed of ten or twelve silkworm strands along the raw kidney surface, instead of the rubber drain. The purpose of the drain is two-fold; first, to remove all secretions, which might interfere with primary union, from the depths of the wound, and secondly, to favor firm cicatricial union by mild irritation of the raw kidney substance and the contiguous deep tissues of the abdominal wound. In tying the deep buried sutures, whether of silkworm-gut or of kangaroo tendon, care must be exercised not to draw them too tightly, as they readily cut through the friable kidney substance. The skin and superficial fat are closed over the deep buried sutures by a running suture of catgut. Union by first intention has been the rule. The dressings are changed for the first and last time on the eighth day, when the drain is removed. The patient is kept upon the back for three weeks, and then allowed to sit up and go about as she pleases.

Although the stitches are passed deeply through the kidney substance, I have only in one case, a double nephrorrhaphy at one sitting, observed hæmaturia or albuminuria after operation, though other writers mention these as of occasional occurrence. Since the experiments of Tuffier have demonstrated that destroyed or ablated kidney tissue is readily and speedily replaced,

under ordinary circumstances, by a liberal regeneration of new kidney structure, we need no longer take into account the slight traumatism inflicted by the passage of needles and sutures.

The mortality of the operation should be practically *nil*. Of my twelve cases I lost one in which the peritoneum was accidentally opened, and a diphtheritic infection of that membrane occurred. The details are narrated in the history of the case as recorded below.

Of the eleven cases which recovered, one, a double nephrorrhaphy performed at one sitting, is as yet too recent to speak of final results. A second patient has not as yet left her bed. Of the other nine, in not one has the sutured kidney, to my knowledge, become movable, the first patient having been operated upon February 8, 1890, and the last, four months ago. Both anatomical and therapeutical results are all that could be desired. None of my patients have worn a supporter of any kind since operation.

I have in the above endeavored to state facts and formulate views based upon my own experience and observations, as well as upon the work of those authors who have preceded me in writing upon the subject of movable kidney. I have avoided lengthy quotations from and frequent references to the writings of others, not from want of appreciation of their work, but from a desire not to extend unduly the limits of this paper.

I append the histories of all the cases of movable kidney, twelve in number, in which I have performed nephrorrhaphy.

CASE I. Movable right kidney; endometritis and hypertrophic elongation of cervix; nephrorrhaphy, with relief of symptoms and permanent fixation of right kidney; subsequently movable left kidney, for a time, with return of symptoms; final cure.—L. K., twenty-two years, single, seamstress, was admitted to hospital January 23, 1890. Menstruation began at thirteen, and with the exception of one year of amenorrhœa, has been regular, though scanty, ever since. Three years ago had a severe and prolonged attack of malarial fever. Since then she has suffered continuously with extreme nervousness, hysterical manifestations, almost constant cardiac palpitation, pyrosis, dyspepsia, constipation, occasional pains in back, and more or less dysmenorrhœa.

Examination: Tubes and ovaries normal in size and position, not tender on pressure. Uterus normal in position; corpus normal in size, cervix markedly elongated. Endometritis. Right kidney normal in size, freely movable between its normal position and a point just within the anterior superior spine of the ilium. Left kidney in normal position.

Nephrorrhaphy, February 8, 1890, after the method described in the body of the paper, the uppermost kidney suture passing through the eleventh intercostal space and embracing the twelfth rib. Uneventful recovery. Patient discharged March 7, 1890.

One year later the patient gave the following account of herself: Following the operation the nervousness, cardiac palpitation,

and stomach symptoms disappeared almost entirely. The dysmenorrhœa and occasional backache, however, persisted, although in less severe degree. For six months she regarded herself as substantially well, when all the old symptoms, one by one, returned. A slight cough developed in addition.

Examination showed persistence of the endometritis and a slight swelling of the left tube. Right kidney immovably fixed behind the scar of lumbar incision. Left kidney movable to the extent of seven to eight centimetres in a downward direction. Signs of incipient phthisis at apices of both lungs. Patient requested operative fixation of the second kidney, but in view of her poor family history (three sisters dead of pulmonary consumption), the condition of her lungs, and a suspicion of developing tubal tuberculosis, I advised waiting.

The patient is, nearly two years and nine months after operation, the picture of perfect health. Immediately following the last report, a year and a half ago, she improved in health and got married. The symptoms due to the movable left kidney slowly but completely disappeared as she grew stouter. She has had absolutely nothing to complain of for a year past, and is now two months pregnant. The right kidney, as several of you have verified by examination, is immovably fixed to the scar of the lumbar incision. The lower edge of the left kidney can be barely palpated, its previous mobility having almost entirely disappeared, due no doubt to increased deposit of peri-renal fat.

CASE II. Movable right kidney; retroversion of uterus; laceration of cervix uteri; trachelorrhaphy and shortening of round ligaments followed by but slight relief; nephrorrhaphy followed by immediate and complete disappearance of symptoms.—Mrs. A. LeB., thirty-seven years, married, mother of five children. Last confinement three years ago; no miscarriages. Menstruation regular, with rare exceptions, the flow lasting seven days. Family history indifferent. For two or three years past has been troubled with general nervousness, and a moderate degree of cardiac palpitation and gastric dyspepsia. During the past four months pains in the left epigastrium, in tenth intercostal space posteriorly, and in left inguinal regions have been the prominent symptoms. Anorexia; bowels regular.

Examination, in narcosis, May 15, 1890. Ovaries and tubes normal in size. Uterus retroverted in second degree. Corpus uteri normal in size. Cervix slightly thickened and enlarged, lacerated for 2.5 centimetres to left. Ectropion of cervical mucosa. Vagina and vulva normal.

Right kidney normal in size, displaced downward and forward to pelvic brim. From this position it can be freely moved across the bodies of the lumbar vertebræ to the left of the spine, thence upward on the left side, and again across the spine to its normal position. Left kidney in normal position.

May 19, 1890. Trachelorrhaphy and shortening of round ligaments, the left ligament being shortened nine, and the right ten centimetres. Primary union of all wounds.

These operations were followed by but slight relief of symptoms, the majority of which were construed as due to the movable right kidney.

Nephrorrhaphy, June 12, 1890, after the method described.

The peritoneum was accidentally opened near the lower pole of the kidney, the rent being immediately closed by running catgut suture. Uneventful and afebrile recovery. Patient discharged four weeks after operation.

Two months later the patient presented herself with the statement that since the nephrorrhaphy she had been perfectly well for the first time in many years, all her disagreeable symptoms having disappeared. The right kidney was found securely anchored to the cicatrix of the lumbar incision. Uterus in normal anteversion. In spite of persistent efforts to trace the patient I have been unable to learn anything of her since.

CASE III. Mobility of both kidneys; endometritis and catarrhal salpingitis; emphysema pulmonum; nephrorrhaphy for fixation of right kidney; complicated recovery; permanent fixation of right kidney and partial relief of symptoms; subsequent increase of adipose tissue, resulting in better support of left kidney, and a complete cure.

—M. A., thirty-four years, single, religious. Family history poor, her father, a brother, and a sister having died of pulmonary phthisis. Menstruation regular, the flow lasting five to six days.

With the exception of symptoms due to pulmonary emphysema patient was well up to four years ago. At that time she began to notice a frequent swelling of the abdomen, and to be troubled with general nervous symptoms and gastric indigestion. The nervousness and dyspepsia gradually became intensified, pains in both inguinal regions were superadded, and the periods became painful. Leucorrhœa, constipation, and occasional scalding on micturition.

Examination, April 25, 1891. Uterus normal in size and position. Endometritis corporis et cervicis. Bilateral catarrhal salpingitis, the tubes being slightly thickened and exquisitely sensitive on pressure. Ovaries normal.

Right kidney normal in size and freely movable in the arc of a circle having its centre at the normal position of the kidney, and a radius of ten centimetres. Left kidney movable to extent of five centimetres in a downward direction.

Nephrorrhaphy, April 29, 1891. Chloroform employed in preference to ether on account of the tendency to bronchitis. Operation as described. Convalescence complicated and retarded by an acute catarrhal pneumonia, involving the lower half of right lung, and lasting 10 days; by an acute endocarditis of a week's duration, and by the formation of a peri-renal abscess, which kept discharging until six weeks after operation, when it definitely healed. Patient discharged June 25th, nine weeks after operation.

Permanent relief of the majority, though not of all the symptoms followed the operation. A year following the operation the right kidney remained firmly anchored in its new position; the mobility of the left kidney, the endometritis, and the salpingitis remained unchanged. Curettement and fixation of left kidney advised. Patient feels so comparatively well, however, that further operative interference is declined.

Patient last seen a few days ago, a year and a half after operation. Her weight had increased from 105 pounds at time of operation to 145 pounds. The great increase of fat has resulted in better support and decidedly lessened mobility of the left

kidney. Right kidney firmly anchored to lumbar scar. With the exception of a slight leucorrhœa patient considers herself in the best of health, and has absolutely nothing to complain of.

CASE IV. *Movable right kidney; nephrorrhaphy; death from acute septic (diphtheritic) peritonitis thirty-six hours after operation.*—A. B., thirty-four years, single. Referred to me by Dr. A. Strong. Family history indifferent. Menstruation regularly every three weeks, the flow lasting three days. Has suffered much and constantly during the past four or five years with dyspeptic symptoms, of which severe pain in the epigastrium, most intense about one hour after meals, was most bitterly complained of. Occasional attacks of nausea, vertigo, vomiting, and constant anorexia the other main symptoms.

Examination, April 28, 1891. Genitalia normal in every respect. Right kidney movable to extent of twelve centimetres forward and downward. Left kidney in its proper place.

Nephrorrhaphy, April 30, 1891. Usual incision—more oblique than ordinarily, on account of limited space between ribs and crest of ilium. Peritoneum accidentally opened near lower pole of kidney. Some time was spent in examining the peritoneal rent to make sure that no viscus was wounded. After satisfying myself that such was the case, the peritoneum was closed by a running catgut suture, and the operation completed in the customary manner. Six hours after operation the patient developed symptoms of acute peritonitis, to which affection she succumbed thirty-six hours after operation.

Autopsy, twelve hours after death. Peritoneum everywhere intensely injected and its lustre lost to a great degree. No adhesions. The injection was most intense in the vicinity of the right kidney, where also a thick reddish fluid to the amount of seventy-five grammes had collected. The peritoneal wound made at operation involves the parietal peritoneum only, no viscus being injured. Kidney sutures were examined and found not to have cut through the kidney substance, which they traversed at a depth of a little over one centimetre from the surface of the organ.

On the morning of operation I awoke with a pain in the throat which I disregarded, not being subject to throat affections. The operation was performed at 9 a.m. Immediately after the operation I noticed that the pain in the throat had increased and that I was slightly feverish. A colleague examined my throat and pronounced me suffering from diphtheria, a diagnosis which further developments confirmed. I believe that while I was bending over and examining the opened peritoneum the latter became infected from the expired air from my throat. The foudroyant character of the peritonitis, unusual even in the most septic forms, would tend to bear out the supposition. Unfortunately, no bacteriological investigation of the peritoneal contents was made.

CASE V. *Movable right kidney; endometritis; bilateral catarrhal salpingitis; curettement, followed by partial relief; nephrorrhaphy seven months later, followed by complete cure.*—A. H., thirty-three years, single, cloakmaker. Father died of pulmonary consumption. Periods regular every four weeks, lasting five to nine

days. Leucorrhœa for the past twenty, and severe dysmenorrhœa for the past fifteen years. Had a fall eighteen months ago, and a constant pain since over pubic region, aggravated on standing or walking. Urination frequent, but without pain or scalding.

Following an attack of typhoid fever and pneumorrhagia six years ago, the following symptoms developed in addition to those above enumerated. It may be added that before the attack of typhoid fever the patient was quite stout, but has never since regained her original weight. She has become moderately nervous; appetite has failed, pain in left half of epigastrium after eating; flatulence, constipation and cardiac palpitation have developed.

Examination, September 3, 1891. Uterus in normal position, slightly and uniformly enlarged. Left ovary and tube normal in size, prolapsed into Douglas' sac. Right ovary and tube normal in size, fastened in normal position by adhesions. Both tubes tender on pressure. Endometritis; double catarrhal salpingitis. Kidneys not examined.

September 14, 1891. Curettement followed by swabbing of uterus with equal parts of carbolic acid and glycerine and gauze drainage.

March 28, 1892. Patient reports that the dysmenorrhœa and the leucorrhœa, from which she had suffered so long and severely; had entirely disappeared since the curettement, the menstrual flow lasting only half as long as formerly and being entirely painless. The nervousness, dyspeptic symptoms, epigastric pains, and cardiac palpitation persisted as formerly.

Examination shows quite normal condition of uterus and appendages. Tubes no longer sensitive on pressure.

Right kidney movable some eight centimetres in a downward direction, a condition entirely overlooked at previous examinations.

Nephrorrhaphy, April 8, 1892, in usual manner, except that kidney was fastened by buried sutures of kangaroo tendon. Primary union; uneventful convalescence.

July 24. Pain in left side has entirely disappeared. Appetite and digestion are steadily improving. Patient considers herself perfectly well. Right kidney remains firmly anchored in its new position.

October 27. Every one of her old symptoms has entirely disappeared. Right kidney, on examination to-day, found securely anchored to the scar of the lumbar incision.

CASE VI. Movable right kidney; laceration of cervix uteri; nephrorrhaphy, curettement, and trachelorrhaphy, at same sitting; cure.—Mrs. E. B., twenty-three years, married, mother of three children, the last born eighteen months ago. Symptoms date from December, 1891. Pain in left half of epigastrium, worse after eating; anorexia; emaciation; nervousness, and especially restlessness at night; headaches; dysmenorrhœa.

Examination, April 23, 1892. Uterus normal in size and position. Adnexa on both sides normal. Cervix uteri slightly lacerated.

Right kidney movable to the extent of ten centimetres in a downward direction. Left kidney in a normal position.

Nephrorrhaphy, curettement, and trachelorrhaphy, at same sitting, April 26th. Kidney fastened by buried kangaroo sutures. Primary union of all wounds.

Relief of all symptoms began within two weeks after operation and persisted when patient was last seen, three months later. Kidney remains fixed in its new position.

October 27. Patient examined, and right kidney found securely fastened to lumbar scar. All her symptoms had vanished as if by magic on the day of operation and have remained away since.

CASE VII. *Movable right kidney; retroversion of uterus; endometritis; double catarrhal salpingitis; curettement, shortening of round ligaments, and nephrorrhaphy; at same sitting; cure.*—A. B., twenty-five years, single, trained nurse, suffered from acute arsenical poisoning in 1887, from typhoid fever and yellow fever in 1888, from influenza and pneumonia in 1891. Menstruation was regular until three years ago; it has since gradually become less frequent until now it occurs about once in four months and is very scant. Four years ago, as a result of severe strain at lifting, the uterus prolapsed completely outside of the body, necessitating reduction under ether.

For past four years she has had chronic dyspepsia, pains of a neuralgic character in various parts of abdomen, headache, extreme nervousness, and pronounced hysteria, with almost constant cardiac palpitation. During the past year leucorrhœa, a pressure pain over pubis, and occasional tumefaction of abdomen have been added to the above symptoms.

Examination, May 8, 1892. Adnexa uteri normal in size, sensitive on pressure. Uterus undersized; retroverted in first degree.

Right kidney of normal size, movable for ten to twelve centimetres in a downward and forward direction. Left kidney cannot be palpated.

Curettement, shortening of round ligaments, and nephrorrhaphy, at one sitting, May 10, 1892.

All operative wounds healed by primary union. Ten weeks after operation patient reports as follows: With the exception of weakness (and well-marked anæmia) she now considers herself perfectly well. The dyspeptic symptoms disappeared two weeks and the leucorrhœa three weeks after operation. Neither has returned. The hysteria and nervousness yielded more slowly but are now almost entirely gone. She was practically a new woman. On examination the uterus is found in normal anteversion and the right kidney securely moored in its normal position.

Efforts made within the past two weeks to trace the patient have proved unsuccessful.

CASE VIII. *Movable right kidney; enaometritis; salpingitis catarrhalis; curettement and nephrorrhaphy; cure.*—J. H., eighteen years, single; began to menstruate at eleven, and ever since has suffered from severe dysmenorrhœa, the flow occurring every four weeks and lasting three to fourteen days. She was otherwise well until thirteen years of age, when she had a severe attack of diphtheria. Following this, the following symptoms developed one by one: Marked emaciation, pains in left inguinal and left epigastric regions, leucorrhœa, anorexia, dyspepsia, periodical tumefaction of abdomen, marked nervousness, headaches, cardiac palpitation, inability to sleep upon the left side,

constipation. For the past five years she has been under the care of many physicians, traveling to Europe a number of times in hopes of finding relief. For the above history I am indebted to her family physician, Dr. George C. Stiebeling, who brought the patient to me for examination, May 13, 1892.

Exaggerated anteversion of uterus. Catarrhal salpingitis of left side with slight thickening of tube. Right appendages normal. Endometritis.

Right kidney moderately enlarged and movable ten to twelve centimetres downward and forward to just behind umbilicus. Left kidney cannot be palpated. Spleen decidedly enlarged.

May 17, 1892. Curettement followed by nephrorrhaphy.

Uneventful convalescence, the wound healing by primary union.

Ten weeks after operation patient reports as follows: The first period following operation was the only painless one of her life. The second was as painful as usual; the third again painless. Every symptom she formerly complained of, with the exception of the nervousness, disappeared as if by magic during the first two weeks after operation, not to appear again. The nervousness had diminished so greatly as to be no longer uncomfortable. The mental condition has changed from one of melancholy to cheerfulness and happiness.

Right kidney remains where it was anchored at operation. Pelvic organs apparently normal.

October 26. The patient remains perfectly well, every symptom, including the nervousness, having entirely and permanently disappeared. Right kidney remains securely anchored in its normal position.

CASE IX. *Movable right kidney; laceration of cervix uteri; endometritis; curettement, amputation of cervix, and nephrorrhaphy, at one sitting.*—Mrs. L. M., forty-three years, married, mother of three children, the youngest being eight years old. Menstruation began at eighteen years, and was regular up to eighteen months ago. At that time an amenorrhœa of three months was followed by the passage of clots (miscarriage?) and free bleeding lasting some six weeks. As a result she became very thin and anæmic, and from this period dates her symptoms. These are: occasional leucorrhœa and scalding on micturition, pain after eating, gaseous eructations, transitory pains in left epigastrium, nervousness, and irritability. These symptoms have gradually increased in intensity. She was placed under my care by her family physician, Dr. A. Rupp.

Examination, June 11, 1892. Ovaries normal in size. Both tubes slightly sensitive to pressure, but not enlarged. Uterus in normal position; corpus of normal size; cervix slightly hypertrophied and lacerated for 2.5 cm. to left. Eversion and erosion of cervical mucosa. Endometritis. Right kidney movable in a downward and forward direction, until its lower pole reaches the median line at a point eight centimetres below the umbilicus. Thence it can be swept around in a circle across the spine to the left and back to its normal position on the right side. Kidney not enlarged.

June 14, 1892. Curettement, amputation of cervix, and nephrorrhaphy at same sitting. Primary union of all wounds.

Patient discharged July 6th, feeling well, and with right kidney in good position.

October 22. Patient presents herself to-day with the statement that all her symptoms have disappeared, and that she considers herself perfectly well. On examination the right kidney is found securely anchored to the scar of the lumbar incision.

CASE X. *Movable right kidney ; descensus et retroversio uteri, both in first degree ; endometritis ; laceration of cervix uteri and of perineum ; curettement, amputation of cervix, and perineorrhaphy at one sitting, followed by scarcely any relief ; subsequently ventrofixation of uterus and nephrorrhaphy, followed by speedy disappearance of symptoms.*—Mrs. S. K., thirty-eight years, married, mother of three children, the youngest being six years of age. Sent by Dr. E. J. Messemer. Menstruates regularly for five days every four weeks. Ever since birth of first child, nine years ago, she has been troubled with the following ills : Leucorrhœa, backache ; pains in all parts of body, fugitive in character (spinal irritation) ; dizziness, nervousness, anorexia, dyspeptic symptoms, cardiac palpitation.

Examination, May 10, 1892. Appendages normal on both sides. Uterus prolapsed and retroverted, both in first degree. Corpus normal in size. Cervix lacerated bilaterally, thickened and elongated. Moderate cystocele and rectocele. Perineum and lower end of vaginal tube lacerated in first degree. Right kidney movable ten centimetres in a downward direction. Left kidney in normal position.

May 13, 1892. Curettement, amputation of cervix, and perineorrhaphy. Primary and firm union. Patient discharged June 9, 1892.

In spite of the successful result of the plastic operations, patient experienced only moderate relief,* the chief annoying symptoms persisting. Among these were various pains, an uneasy feeling in the right lumbar region, great nervousness, dyspeptic symptoms, and a full feeling in vagina.

Examination June 26. Slight cystocele persists ; rectocele has disappeared. Uterus still low in pelvis and retroverted in first degree. Kidneys as at first examination.

June 28. Nephrorrhaphy and ventrofixation of uterus at same sitting. The nephrorrhaphy in this case proved unusually difficult, the patient being short and stout, and the distance between the last rib and crest of ilium measuring but four centimetres. An unusually oblique incision was employed, and the operation successfully completed under great disadvantages.

The nephrorrhaphy and the coeliotomy wounds healed by first intention. Convalescence was complicated and prolonged by an acute catarrhal pneumonia which developed a week after operation, and ran a course of one week, and by a phlegmasia alba dolens of right leg (thrombosis of right femoral vein), beginning two weeks after operation and keeping the patient in bed until July 27th. Discharged August 6th, with both uterus and kidney held well in place. Nearly every one of her former symptoms disappeared before she left hospital.

October 27. Every symptom of which the patient formerly complained has disappeared and remained away. The right leg still a little swollen. The sutured kidney remained securely anchored in its normal position.

CASE XI. *Mobility of both kidneys following removal of a large ovarian cystoma ; double nephrorrhaphy at one sitting.*—M. B., forty years, single, domestic, was referred to me by Dr. Carl Edel. On June 17, 1892, I removed from patient a large, many-chambered ovarian cyst filling the abdomen. Twisting of the pedicle had occurred, the cyst had become strangulated, and all its chambers were filled with blood, fluid and clotted. Patient made an uneventful recovery from the ovariectomy, and was discharged four weeks after operation. Dyspeptic symptoms and general nervousness, which had existed for some time prior to the development of the ovarian tumor, but had disappeared with the increase of the abdominal enlargement, now reappeared with increased severity. On examination before leaving hospital both kidneys were found to be freely movable ; the right down to the anterior superior spine of the ilium, the left from 8 to 10 centimetres in a downward direction.

Double nephrorrhaphy, October 11, 1892, the left kidney being first sutured. I found it very difficult to operate on the left kidney, the organ showing a tendency to hide behind the ribs. It required one hour to sew the left kidney, and a further half-hour to fixate the right.

Patient has made a perfectly uneventful recovery. On the third day a slight transient albuminuria was noticed, which disappeared in a few hours, not to return. This is the only one of my cases in which albuminuria was noted after nephrorrhaphy.

November 10, 1892. Patient left her bed three weeks after operation. Both kidneys are securely anchored in the loins, and the patient's symptoms have vanished.

I record the case more especially because double nephrorrhaphies are as yet comparative rarities.

In Lindner's collection of twenty-nine nephrorrhaphies, the double operation figures but twice ; Hahn, in 1881, operated at two sittings, four months apart, upon the right and left kidneys of the same patient, and Kuster performed a double nephrorrhaphy at one sitting in 1883.

CASE XII. *Movable right kidney ; retroversion of uterus ; cirrhosis of left ovary ; double uterus ; mitral insufficiency ; nephrorrhaphy, curettement, unilateral salpingo-oophorectomy and ventrofixation of uterus at one sitting ; recovery.*—K. H., twenty-three years, single, domestic, has been ill for nearly two years with a variety of symptoms, evidently due to a number of pathological conditions. The chief complaints noted are cough and dyspnoea on exertion, cardiac palpitation, cardialgia, frequent vomiting spells, nausea, gaseous eructations and distress after meals, constipation, pain in back, leucorrhœa and coccygodynia.

Examination, October 15, 1892. Uterus somewhat large, retroverted in second degree. Tubes and ovaries on both sides normal in size, non-sensitive on pressure. Left ovary very hard (cirrhosis). Right kidney normal in size, movable seven to eight centimetres in a downward direction. Rude systolic bruit over left ventricle and apex of heart. Spleen moderately enlarged. Lungs normal.

Operative interference dissuaded from on account of the multiplicity of lesions conjoined with organic cardiac disease. The possibility of death on the table was presented to the patient.

She, however, insisted on operation, stating that she preferred risking her life in trying to get well to living further in the same misery.

On October 25, 1892, under ether anaesthesia, I performed nephrorrhaphy, curettement, salpingo-oophorectomy (the left tube and calcareous left ovary being removed), and ventrofixation of the uterus, at one sitting. At the curettement it was noticed that the curette could be passed into two different cavities within the uterus, with a partition between them. On opening the abdomen the corpus uteri was found to be double (with a single cervix). The two halves were fused along the median line, each corpus having but one tube and ovary. The larger, right half of the uterus was ventrofixated in the usual way.

November 10. Patient has thus far made an uneventful recovery, is out of danger, and is feeling well.

RÉSUMÉ.—The subject of movable kidney is of paramount importance and interest to every practitioner of the healing art, but especially so to the gynecologist.

Movable kidney is of much greater frequency in the human female than is generally supposed. Of a series of five hundred women examined by the author, ninety were found the possessors, amongst other things, of movable kidneys.

The affection *appears* to be comparatively rare among men.

In the overwhelming majority of cases the right kidney alone is movable.

Not every movable kidney produces symptoms.

The symptoms of movable kidney frequently both coexist with and simulate those of various diseases of the female sexual organs. The discriminating diagnosis may offer difficulties.

Atrophy or absorption of the peri-renal fat is the chief etiological factor in the production of movable kidney. Other causes assigned by various authors are : tight lacing, laxity of abdominal walls, congenital predisposition, and severe straining.

A distinction should be maintained between movable and floating kidney.

A movable kidney is one movable within a pouch or hollow formed within its own fatty capsule. A floating kidney has normal relations with that portion of its fatty capsule which it carries with it in its excursions, and is supplied with a mesonephron, the length of which determines the degree of mobility. This paper deals only with the movable kidney.

The symptoms are likely to be more distressing in the earlier than in the final stages of movable kidney.

The most characteristic combination of symptoms of uncomplicated movable kidney is the following : Digestive disturbances, chronic in character ; epigastric pain, usually located somewhat to the left of the median line ; general nervousness ; cardiac pal-

pitiation ; inability to feel comfortable, or to sleep, when lying on the left side.

The other symptoms associated with movable kidney occur less frequently and are of secondary significance.

The symptoms of movable kidney are accentuated during menstruation and the early months of pregnancy. They disappear during the latter half of pregnancy and during the existence of large intra-abdominal growths.

The symptoms of movable kidney are due to pressure and traction upon, stretching, and irritation of various parts of the solar plexus of the sympathetic and of its branches. The theory of obliteration of the lumen of the duodenum, by pressure or traction, is insufficient to account for the symptoms.

A movable kidney is the easiest of all intra-abdominal conditions to diagnosticate. The diagnosis is made by palpation of the displaced organ.

A kidney once movable never becomes firmly fastened in its normal position except by operative interference.

The symptoms due to movable kidney may be ameliorated by the dorsal decubitus, the Weir Mitchell treatment, massage, electricity, and abdominal supporters. All of these measures are, however, in the large majority of cases disappointing, and the benefit obtained, if any, is likely to prove only transient.

Nephrectomy, or extirpation of the movable kidney, is too radical and dangerous a resource as compared with nephrorrhaphy.

Nephrorrhaphy *properly* performed upon properly selected cases can, as demonstrated by appended histories, be depended upon to afford relief, with a good prospect of the permanency of the latter.

ADDENDUM.—From the date of reading this paper (October 27, 1892) to the date of revision of proof (March 10, 1893) I have performed ten further nephrorrhaphies for movable kidney. All of these made good and perfectly smooth recoveries, although in all of them but three, one or more additional operations were performed upon the genital organs at the same sitting. This makes my personal statistics twenty-two nephrorrhaphies with one death. (*vide* Note, page 28.)

For buried sutures to fasten the kidney to muscle and aponeuroses, I now use silkworm gut exclusively, having abandoned kangaroo tendon for reasons which this is not the proper place to enter upon.

I have had occasion since reading the paper to see again most of the eleven cases whose histories I have recorded above. In all of these, as well as in the ten patients since operated upon, the fastened kidneys remain securely anchored in their new posi-

tion. In fact, I do not know of a single case in which I have performed nephrorrhaphy in which the fastened kidney again became movable.

For the sake of completeness I append an outline of the ten additional cases operated upon. Their histories are but a duplication of the twelve reported in full above, and to record them at length would be weary to the reader.

CASE XIII. M. K., aged thirty-five years, married. Endometritis; laceration of cervix and perineum; adherent retroverted uterus; cystoma of right ovary; movable right kidney; insufficiency of mitral valve.

May 17, 1892. At one sitting; Curettage of uterus; amputation of cervix; ovariectomy; liberation and ventrofixation of uterus.

Recovery and partial disappearance of symptoms.

November 8, 1892. Nephrorrhaphy and perineorrhaphy at one sitting.

Recovery and complete cure.

CASE XIV. S. S., aged twenty-seven years, married. Hæmatoma of left ovary; movable right kidney; hystero-epilepsy.

February 16, 1892. Unilateral salpingo-oophorectomy, followed by disappearance of the epilepsy; the hysteria and symptoms due to the movable kidney persisting.

November 18, 1892. Nephrorrhaphy. Recovery, followed by disappearance of nearly all symptoms during the next two months.

CASE XV. A. B., aged nineteen years, single. Antelexion of uterus; fungous endometritis; catarrhal salpingitis; movable right kidney.

September 12, 1891. Amputation of cervix uteri, with no relief of any kind.

December 22, 1891. Curettage and iodoform gauze drainage of uterus. Some relief followed this treatment.

During the spring of 1892 rapidly growing cystomata developed, under observation, in both ovaries.

June 28, 1892. Double ovariectomy and ventrofixation of uterus. Uneventful recovery, but persistence of the symptoms due to the movable right kidney.

December 2, 1892. Nephrorrhaphy. Recovery and complete cure.

CASE XVI. A. L., aged twenty-five years, single. Emphysema pulmonum; bronchitis chronica; endometritis; movable right kidney.

December 2, 1892. Curettage of uterus and nephrorrhaphy. Recovery. Disappearance within two months of all symptoms except those due to pulmonary emphysema, and general nervousness, which latter has, however, considerably improved.

CASE XVII. M. W., aged twenty-three years, married. Endometritis; catarrhal salpingitis; movable right kidney; pulmonary phthisis.

January 6, 1893. Curettage of uterus and nephrorrhaphy. Recovery and partial disappearance of symptoms. When last seen, two months after operation, was suffering from morbus maculosus Werlhoffi.

CASE XVIII. A. O'C.; aged twenty years, single. Endometritis; movable right kidney; menstrual epilepsy.

January 6, 1893. Curettage of uterus and nephrorrhaphy. Recovery. Patient left hospital feeling well, but has not reported since.

CASE XIX. K. O'R., aged thirty-one years, single. Movable right kidney; endometritis.

January 27, 1893. Curettage of uterus and nephrorrhaphy. Left hospital improved, February 20, and has not been heard from since.

CASE XX. M. B., aged eighteen years, single. Movable right kidney; endometritis.

February 10, 1893. Curettage of uterus and nephrorrhaphy. Horse-shoe kidney. Recovery; still in hospital.

CASE XXI. A. M., aged twenty-three years, single. Movable right kidney; pneumo-phthisis.

February 14, 1893. Nephrorrhaphy. Recovery; still in hospital.

CASE XXII. G. C., aged thirty-one years, single. Movable right kidney; endometritis; left salpingo-oophoritis; fissures of anus.

February 14, 1893. Curettage of uterus, nephrorrhaphy, and dilatation of sphincter ani. Patient still under treatment.

NOTE.—Up to the date of publication of this reprint, July 26th, 1893, the author has performed nephrorrhaphy upon thirty-five patients in all, with but one death (Case IV., page 19). Eight of these were bilateral nephrorrhaphies, forty-three kidneys being sewn fast in thirty-five women. In seven of the eight double nephrorrhaphies both kidneys were operated upon at the same sitting; in the eighth the operations were performed at two sittings, four and a half months apart.

The statement made on page 27: "I do not know of a single case in which I have performed nephrorrhaphy in which the fastened kidney again became movable" still holds good.

DR. G. M. EDEBOHLS presented two patients upon whom he had performed.

BILATERAL NEPHRORRHAPHY

fastening a movable right and a movable left kidney at the same sitting.

The first patient was one whose case (Case XI) he had already published in detail in his recent paper on Movable Kidney (*American Journal of the Medical Sciences, March and April, 1893.*) He presented her this evening for the purpose of demonstrating the permanent fixation of both kidneys in their new positions.

The second patient was a widow of thirty-nine, who had never conceived and who had for more than ten years past suffered from the usual symptoms associated with movable kidney. During all that time she had received much and varied treatment, chiefly directed to the genital organs, without any relief, the mobility of her kidneys passing undetected until she came under the care of Dr. Edebohls.

Her most annoying symptoms were apparently connected with the bladder, consisting of frequent attacks of painful micturition, with sudden interruptions of the flow, and occasional complete suppression of urine, generally lasting from twelve to fifteen hours. The bladder although tender on pressure, gave no other evidence of disease on careful examination. The suppression of urine was interpreted as the result of kinking or torsion of the ureters due to the mobility of the kidneys. The patient had found out for herself that the only way to relieve it was to assume the recumbent position, when a free flow of urine soon followed. During a week of observation preceding operation her urine was examined daily and was invariably found to contain albumen. No casts, however, were discovered.

The right kidney was movable about twelve, and the left some ten centimetres, in a downward direction, so that the hands, one pressing from the hypochondrium backwards and the other from the lumbar region forwards, could easily be made to meet above the upper pole of either kidney, between that organ and the free border of the ribs. The kidneys were thus palpable in their entirety and were found normal in shape and size.

Double nephrorrhaphy was performed on March 10, 1893, both kidneys being operated upon at the same sitting.

The albuminuria persisted for ten days following operation, and then disappeared, not again to return. The wilfulness of the patient, sitting up in bed repeatedly during the first six days after operation, interfered to a slight extent with wound healing, but did not nullify the result as far as anchorage of the kidneys

was concerned, both of which are to-night firmly moored to the lumbar scars.

The symptoms, nervous, gastro-intestinal, genital, vesical and urinary, which have existed for so many years have, nearly all of them, entirely disappeared since operation, and the delighted patient considers herself perfectly well.

DR. EDEBOHLS reported a third case of

BILATERAL NEPHRORRHAPHY

performed upon the patient, a girl of twenty-six, whom he had presented to the Society at its last meeting, and in whom, as the members who examined her will recall, the right kidney was displaced some fifteen and the left some thirteen centimetres downward, both organs being excessively movable.

The case was of interest because the patient, an otherwise healthy country girl, with no nonsense or hysteria about her, presented an array of symptoms, such as dysmenorrhœa, pains in left ovarian region, general pelvic distress and intolerable bearing down sensations which most gynecologists would look upon as probably indicating disease in the genital sphere. Yet on careful examination the genital organs were found absolutely normal, and *all* her symptoms were interpreted as due to the movable kidneys.

Double nephrorrhaphy was made on April 7th, both kidneys being sutured at the same sitting. Recovery had been uneventful; it was yet too early, however, to speak of therapeutic results.

DR. EDEBOHLS next showed a patient, a girl of twenty, upon whom he had operated for

MOVABLE RIGHT KIDNEY AND ENDOMETRITIS ASSOCIATED WITH MENSTRUAL EPILEPSY,

on Jan. 6th, 1893, performing curettage of the uterus and nephrorrhaphy at the same sitting, and whose case he had outlined in the paper above alluded to (Case XVIII).

For two years previous to coming under his care she had suffered from dysmenorrhœa and hystero-epilepsy during the whole of each menstrual period, the flow occurring every four weeks and lasting five days. Since the operation she had had three periods. In none of them did the hystero-epilepsy recur and in but one did she experience dysmenorrhœa.

The curious feature of the case was that the left kidney, which at the time of operation was in its normal situation, was now displaced far downwards, at least fifteen centimetres, towards the pelvis, while the right kidney remained securely anchored where Dr. Edebohls had fixed it. The patient had, for some reason not



perfectly clear to him, grown very thin since operation, and absorption of the peri-renal fat no doubt explained the excessive and rapidly acquired mobility of the left kidney.

He had been able to relieve many patients with minor degrees of movable kidney by ordering a well-fitting and tight corset, the pressure of which crowded the displaced organs into place. This was not a case, however, that could be relieved in that way, the kidney being below the waist line of the corset, the tightening of which would therefore crowd the organ further downward rather than upward to its normal situation.

DR. EDEBOHLS also presented a patient, a married woman of twenty, with

MOBILITY OF BOTH KIDNEYS, ENDOMETRITIS AND CATARRHAL
SALPINGITIS

on whom he proposed first to perform a double nephrorrhaphy, as he considered most, if not all, of her symptoms due to the movable kidneys, and to follow the operation, if necessary, by treatment directed to the uterus and tubes.

He showed the patient mainly for the purpose of demonstrating what enlarged experience had taught him was the best method of examining for movable kidney. This was to examine with the patient standing, the examiner sitting at her right side. After the right kidney had been palpated, the examiner, without changing his or the patient's position, reached around her in front and behind and felt for the left kidney. Since adopting this method of examination he had found more movable left kidneys than formerly.

Both in this patient and in the one presented at the last meeting, neither kidney could be felt with the patient lying on the back. Yet on assuming the erect attitude, the four kidneys fell out of their places to various distances ranging from eight to twenty centimetres.

DR. EDEBOHLS next presented a recent device of his:

AN AIR CUSHION TO FACILITATE NEPHRORRHAPHY.

In his paper, already alluded to, on "Movable Kidney," he had advised the performance of nephrorrhaphy with the patient in Sims' position. Further experience with the operation had taught him a preferable position, especially so when both kidneys were to be operated upon at the same sitting. He had already insisted upon the fact that the one thing which made the operation easy or difficult was the proper or improper position of the cushions placed between the table and the patient's abdomen with a view to crowding the viscera, and on top of them the kidney, towards the site of operation in the lumbar region. The proper placing of these cushions and their maintenance in posi-

tion was not always an easy matter, and frequently the operation had to be interrupted to readjust them.

He had overcome all these difficulties by operating with the patient lying flat upon the abdomen and anterior surface of the chest upon the table. After the lumbar region had been prepared for operation by washing, the patient was lifted sufficiently to allow the cylindrical air cushion shown to be placed transversely across the table beneath her abdomen. The air pressure crowded the abdominal viscera towards the lumbar regions, carrying the wandering kidney or kidneys back to their normal situation.

The air cushion was a perfect cylinder of rubber, twelve inches long by eight inches in diameter, and inflated by a foot-ball valve and key, the valve being secured in the centre of one head of the cylinder. Any manufacturer of rubber goods could make one, or J. Reynders & Co., 303 Fourth Ave., N. Y., would supply them.

The maintenance of anesthesia was easy in the position described, the face being turned to one side and the elevation of the abdomen upon the cushion freeing the chest from pressure by the table. In performing the operation on the Edebohls table the anterior surface of the thighs rested upon the table, while the legs and feet were suspended by means of the Edebohls legholders. In using a longer table the entire lower extremities lie upon the table. The position should prove a good one also for other operations upon the kidney, as well as for sacral proctectomy or hysterectomy, and in his next case of either of the latter he proposed to give it a trial.

The use of this cushion has also enabled Dr. Edebohls to improve upon the technique of the operation itself. Instead of passing the sutures through the kidney in the depths of the wound, he now took the kidney to be operated upon out through the lumbar incision, and thus having free access to the entire organ he was able to inspect and palpate it thoroughly and to do much more accurate work, splitting and reflecting the capsula propria to the exact extent required, and in the exact situation desired. He then passed his sutures, to the number of five generally, through the kidney, after which the kidney was replaced in the body and the ends of the kidney sutures passed on each side through the muscles and fascia. Previous to tying them he had the cushion taken away, so as to remove the tension upon the lips of the lumbar incision and permit of the easy approximation of the deep portions of the wound, so that cutting of the buried sutures through the kidney substance by reason of too great tension was avoided. He was perfectly satisfied both with the technique and the results of nephrorrhaphy as he now practiced it.

